Previous Section

3.0 -- GCO Development

The GCO must provide potential bidders an understanding of specific Government user needs for technical information throughout all relevant life-cycle activities of the defense system. The effective definition of the technical data requirements necessitates the complete identification of data needs and uses. Identification of these data requirements can be effectively accomplished through the use of a well-defined process described in 3.1 -- 3.8. A flow chart of the entire process is shown in figure 5-2.

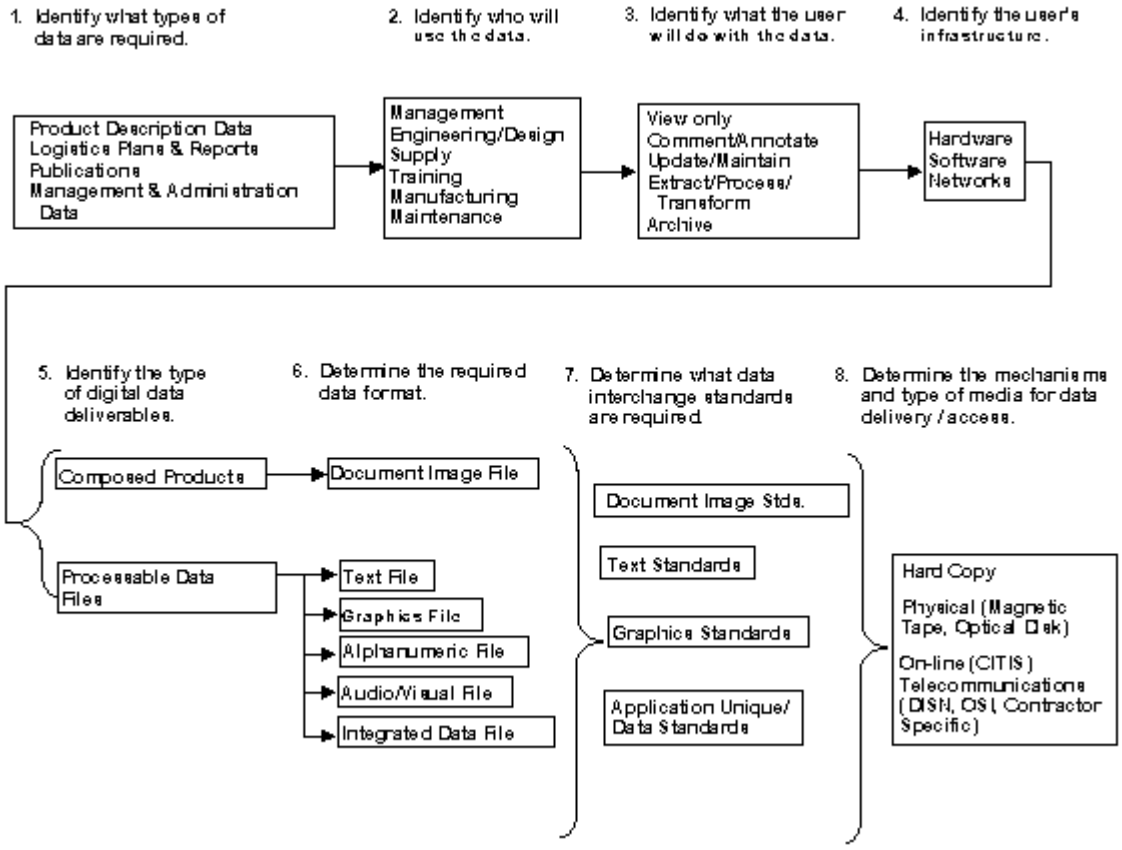

Figure 5-2. -- GCO Development Process.

3.1 -- Identify Data Type Deliverables

Data type deliverables are the data requirements specified on the Contract Data Requirements List (CDRL), Contract Line Item Number (CLIN), or Exhibit for a typical program. A survey of supporting defense system activities during the Requirements Determination/Data Call will establish data requirements. The data types selected will ultimately influence data format, interchange standards, and media considerations.

Sample data types to be digitally developed, accessed and/or delivered, and maintained are listed in table 5-1. Note that table 5-1 is not intended to be all inclusive, nor does it suggest that all listed data are required in any particular contract.

Management & Admin. Data:	Logistics Data:
. Conference Agenda	. Level of Repair Analysis (LORA) Report
. Conference Minutes	. Integrated Support Plan (ISP)
. Contract Change Proposal	. Maintenance Support Plan
. Cost Data Summary Report	. Parts List
. Fund and Man-hour Expenditure Report	. Failure Mode, Effects, and Criticality Analysis Report
. Contractor's Progress, Status & Mgmt. Report	. Production Test Plan
. Physical Inventories Report	. PMS Failure Modes and Effects Analysis
. Engineer Design Test Plan	. Test and Evaluation Program Plan
. Producibility Analysis Report	. Reliability Test Reports
. Hazardous Waste Report	. Data Management Plan
. System Engineering Mgmt. Plan (SEMP)	. Environmental Stress Screening Plan
. **Product Description Data:**	. **Publications:**
. Engineering Drawings	. Scientific and Technical Reports
. Installation Control Drawings	. Interactive Electronic Technical Manuals (IETMs)
. Technical Data Package	. Electronic Tech. Manuals (ETMs)
. Request for Deviations	. Software Users Manual
. Engineering Change Proposal	. Performance Specifications Documents
. Request for Waiver	. Commercial Off-The-Shelf Manuals
. Aperture Cards	. Operating Procedures Manual

. Design Data and Calculations	. Computer Operation Manual
. Functional Flow Diagrams	
. Test Plan	
. Telecommunications System Engr. Plan	

Table 5-1. -- Typical Data Type Deliverables.

3.2 -- Identify Data Users

The data users are the functional organizations that will require access to the program data. These organizational areas can include: management, engineering/design, supply, training, manufacturing, and maintenance. In addition to their functional responsibilities, these organizations are defined by their location and the specific disciplines involved. See exhibit 2, table 3-1 for an example.

The data user information provides potential bidders with an understanding of the separation of work functions and the scope of geographic locations for data transmission requirements or other modes of data delivery or access.

3.3 -- Identify Data Use/Processing

The data use requirements are the ways in which the user can process the chosen data types. They are valuable in minimizing infrastructure investment while providing needed capability. For example, a user with a view-only requirement may be able to satisfy a need to view two-dimensional design data using a typical desktop computer suite. A user with an update/maintain requirement may require a full engineering workstation to edit 3-dimensional CAD/CAM files. The Program Manager will need to match the digital data deliverables to the existing or planned suite of equipment that makes up the users' infrastructure.

The Program Manager will need to identify the use of the data types by the support organizations chosen for the program. The five defined methods of data processing typical of most defense systems are described below.

- ***View Only*** -- the ability to examine a data file without the ability to change it. This includes viewing selected portions of one or several documents as well as side-by-side comparisons of documents.

- ***Comment/Annotate*** -- the ability to evaluate and highlight for future reference or to make annotations, approvals, and comments without the ability to change the original file. Annotations are associated with a specific item or location within a document such that the annotations are displayed whenever that point or area of the document is displayed.

- ***Update/Maintain*** -- the ability to change data either directly or through controlling software in the active files on the host computer.

- ***Extract/Process/Transform*** -- the ability to extract and modify the format, composition, and structure of the data into another usable form.

- ***Archive*** -- the placing of inactive data into a repository to preserve it for future use.

To complete this step in the GCO process, the Program Manager needs to identify the deliverables required by the organizations using his data. An added benefit of this task is that as each organization determines its use of the data, deliverables are often identified that are no longer needed and can therefore be dropped from the CDRL, resulting in a cost savings for the program.

3.4 -- Identify Data User Infrastructure

The program office must ensure that authorized recipients of digital data have the capability to receive, store, and maintain the data. The evolution of this required infrastructure is a key consideration in managing data for any given acquisition. Deficiencies in the Government's infrastructure may require investments by the acquisition program to effectively implement the data management strategy. The Information Technology Management Reform Act (ITMRA) may require approval or proper exemptions on some acquisitions for computers (hardware and software) and related services. The planning process for each acquisition must consider this additional lead-time.

The availability of digital data processing and telecommunications technology and approved standards for creation, storage, transmission, data protection, and integrity of data at the time of delivery or access are important criteria for acquisition decisions. The current and projected capabilities of both the contractor and Department of Defense (DoD) components (military services and Defense Logistics Agency [DLA]) must be assessed with respect to program needs and schedules. The GCO is an excellent vehicle for making these determinations. It is especially important to obtain at least a general idea of the infrastructure available and planned early in the planning process to allow a draft architecture and rough order of magnitude cost estimate to be developed.

The data user infrastructure is the computing environment available to a particular user. This environment establishes the data processing capabilities of that user. The following areas identify a user's infrastructure:

- **Hardware:** Determine the current and planned hardware available to support the program.

- **Software:** This is the most critical element. Interoperability will normally be achieved through the use of software. Again, determine both present and future software applications and availability.

- **Networks:** Determine the local- and wide-area networking capabilities and whether CITIS will be used.

- **Data user personnel:** Consider the skills and expertise required to accomplish identified data use requirements.

- **Computer support personnel:** Consider the skills and expertise required to establish, operate, and maintain a functional and reliable computing environment.

- **Communications:** Determine data communication capabilities.

To assist the Program Manager in determining the user's infrastructure and how it will affect the type of data required, a data acquisition questionnaire, exhibit 1, has been developed. Responses to the questionnaire will aid in giving potential bidders, as well as the Government, a clear picture of the supporting infrastructure in place to support the defense system. The data users' infrastructure or data processing environment will influence selection of the delivery/access method and data formats. Since each supporting activity (data user) may have quite different infrastructures, the Program Manager will need to be aware of the various data requirements imposed by the different infrastructures and make attempts to bring commonality to the suite of tools available.

3.4.1 -- Automated Information Systems (AISs)

The Program Manager is responsible for determining which of the various AISs that are in place, or soon to be in place, to accept, create, manage and use digital data will be used to support the program. Some AIS examples include the Joint Computer-aided Acquisition and Logistics Support (JCALS) system and the Joint Engineering Data Management and Information Control System (JEDMICS). Any data deliverables that will require updating and maintenance throughout the life cycle of the defense system (engineering drawings, TMs, etc.) are excellent candidates for digital delivery and making use of the standard AISs. Use of these systems will allow for a more common approach across DoD, and they should be considered during GCO development. To provide potential bidders with a better understanding of how the data will be used, the AISs should be briefly described in the GCO. Appendices **Air Force**, **Army**, and **Naval Forces** contain descriptions of Service-specific AISs.

3.5 -- Identify Type of Data Deliverable

Following are types of digital deliverables supported by delivery and access methods specified by Program Managers. Detailed information to assist in developing CDRL specifications for these deliverables is provided in Appendix I of DoD 5010.12-M (May 1993).

- **Composed Products:** Human-readable documents in digital image format. These products display pages, illustrations, or other objects as single entities that users cannot edit. Examples of composed products include facsimile transmissions and raster images of pre-composed documents (e.g., engineering drawings and technical manuals).

- **Processable Data Files:** Machine-readable data that users can input into and edit using multiple data applications to produce standard and custom documents. Examples of processable files are text files and vector graphic files. Files available in standard data exchange formats (e.g., Standard Generalized Markup Language [SGML]) are more widely transportable among dissimilar hardware and software applications.

Since composed products cannot normally be modified, this file type is recommended primarily for legacy data. Processable data files are the preferred data type for most new deliverables.

Program Managers should also be aware of neutral file formats such as Portable Document Format (PDF, see para.3.9.3). These types of files fall between composed and processable formats -- they are not fully processable, but they are much more intelligent than composed products, and are therefore becoming very popular, especially for legacy data.

3.6 -- Determine Data Format

The Program Manager will need to identify the data format(s) for delivery, which is determined by the type of data deliverable described in paragraph 3.5. The chosen formats will affect interchange standards used and the media used for data delivery. The following data formats are the forms in which each of the types of data deliverables can be procured. Refer to figure 5-2 for their relationships to the type of data deliverable.

- Document Image File
- Text File
- Graphics File
- Alphanumeric File
- Audio/Visual File
- Integrated Data File

There is little benefit to receiving hard copy deliverables for any use other than view only. Realizing that most data generated by the contractor now starts out in some digital format (word processing, graphics development, spread sheets, CAD, etc.), the Program Manager should avoid hard copy format whenever possible. As a minimum, document image files (page description language files) or neutral data format files (e.g., PDF) should be considered for distribution in lieu of hard copy.

Most deliverables generated by the contractor can be utilized in their native format (processable data files) if the Government has a compatible suite of hardware/software or a CITIS environment is employed. Also, text, graphics, alphanumeric, audio/visual, and integrated data file formats lend themselves to applying the CALS standards for data interchange (see figure 5-2). However, it may not be cost effective to apply CALS standards to these data formats until the final deliverable. For example: a TM will go through many iterations of authoring, review/comment, editing, and distribution before the final delivery. Typically, the manual is being developed on a word processor or desk-top publishing system. It may not be cost effective to invoke the MIL-M-28001 CALS standard until such time that the Government has the infrastructure in-place or takes final delivery of the document and thereby becomes responsible for its configuration control, archiving, and maintenance. Therefore, the Program Manager may want to take advantage of the native file format during the early phases of the contract if compatible with the existing Government infrastructure.

Specific data formats and delivery modes will be stated on individual DD Form 1423 CDRL items. Proper safeguards will be used for classified information (DoD 5520.22M). In general, the following formats and delivery media are recommended for each data type.

- **Management and Administrative Data:** Mutually Agreeable Commercial Software (MACS) formats. Text-based documents should be generated in a commonly-used, word processing format. Ancillary graphics, spreadsheets, and other associated data files should be developed

in common business software. This data should be available on-line. On-line management status data should be analogous to that available to contractor program managers.

- **Product Description Data:** Mutually agreeable native CAD formats delivered/accessible on-line. Although Initial Graphics Exchange Specification (IGES), MIL-D-28000 format, has been recommended in the past, IGES will soon be overtaken by the Standard for the Exchange of Product Model Data (STEP). As digital format and delivery standards are introduced for additional product description data (i.e., intelligent product data, models, etc.), CDRL delivery requirements may be modified appropriately.

- **Logistics Plans and Reports:** Mutually Agreeable Commercial Software (MACS) formats delivered/accessible on-line. Text-based documents should be generated in a commonly-used, word processing format. Ancillary graphics, spreadsheets, and other associated data files should be developed in common business software.

- **Publications:** Publications, manuals, specifications, and other documentation that will be updated and maintained over the life cycle of the program should be developed in SGML, MIL-M-28001, with graphics in Computer Graphics Metafile (CGM), MIL-D-28003, and delivered/accessible on-line. IETMs should be developed according to standards appropriate for the class of IETM being developed (e.g., MIL-PRF-87269 for class 3 IETM). Other publications should be developed in MACS software.

For all data types, data files that would overburden the network are still recommended for delivery via physical media (e.g., magnetic tape) in accordance with MIL-STD-1840.

3.6.1 -- Legacy Data

Legacy data is technical data (logistics data, engineering drawings, technical manuals, etc.) that was developed and archived before the implementation of CALS initiatives. Depending on its anticipated use, legacy data can be retained in its original native format (typically paper or aperture cards), scanned in and stored in raster or neutral data format (e.g., PDF), or recreated as a processable file. The decision on whether to convert any existing technical data item (manual, drawing, etc.) will be based on factors such as current life-cycle stage, volume of data, economic feasibility of conversion, and data usage and frequency of change. In general, if the data item is frequently used then it should be converted to some type of digital format (raster or neutral format). If the item will be updated, it should be converted to a processable format compatible with the formats used for the current program. Data already existing in digital format should simply be converted into compatible formats. The Statement of Work (SOW) /Statement of Objectives (SOO) will specify any legacy technical data items that will be required to be converted for viewing through the IDE.

Some of the Services have already initiated legacy data conversion programs in which active legacy information, particularly technical manuals and engineering drawings, are being converted to digital format. Typically, these efforts involve conversion of paper or aperture card to raster or neutral file formats such as PDF.

3.7 -- Determine Data Interchange Standards

Complying with data exchange standards will maximize the Program Manager's ability to share data across dissimilar information systems. While several MIL-STDS and MIL-SPECS currently address formats for data creation, storage, and interchange, many of these standards are being eliminated under the Acquisition Reform effort. Other standards are being transitioned to performance (MIL-PRF) specifications. Standards set boundaries for data acquisition and management. However, to achieve "best value" in data as well as in weapon systems, data interchange standards must be neither restrictive nor prescriptive. They must be driven by existing and emerging commercial standards as well as by programmatic business needs. Where applicable and more advantageous, Program Managers should adopt commercial product data creation, storage and interchange standards. Commercial standards often:

- accommodate more current technology,
- are more tested and reliable than similar military versions,
- are less expensive to invoke when contractors are more familiar with the commercial standards and orient their operations to them, and
- increase the potential for use of commercial off-the-shelf items to meet DoD requirements.

The following types of interchange standards are used with data formats listed in paragraph 3.6.

- Document Image Standards
- Text Standards
- Graphics Standards
- Application Unique/Data Standards

3.8 -- Determine Data Delivery and Access Media

The two options that a Program Manager may use to support digital delivery requirements are physical delivery and on-line access/delivery via telecommunications. Digital delivery and access requirements are specified through the SOW/SOO, the CDRL, and specific Data Item Descriptions (DID).

In general, on-line delivery and access are recommended for the following data types: program management data, product description data, logistics data, and technical publications. Physical delivery via magnetic disk, magnetic tape, or optical disk is recommended only for data that will overburden the network.

3.8.1 -- Physical Media

Magnetic tape is a mature, stable technology that is able to handle the large volumes of data typically associated with a major defense system acquisition. Magnetic tape standards are well defined, and little additional investment cost will be involved. However, other media may be more efficient and, therefore, preferred.

Magnetic disk is also widely implemented on personal computers and work stations and may be the physical medium of choice for small business contractors. Several primary de facto magnetic disk formats are available but no official standard has been accepted. Compatibility problems exist, but can be overcome with only moderate effort.

Optical media is used here as a generic term to include Compact Disk-Read Only Memory (CD-ROM), Write Once and Read Many Times (WORM), and rewritable disk or write many read mostly. These media are not yet as widely implemented as magnetic disk, but the percentage of personal computers with CD-ROM drives is increasing rapidly. Optical media are ideal for mass distribution and archival purposes for large volumes of data.

3.8.2 -- On-line Access/Delivery

Program Managers can achieve on-line delivery via two methods:

- delivery of CDRL items from a contractor to a Government repository via telecommunications download, or

- on-line access, which allows the acquisition program to store and maintain data items at a contractor's site for retrieval and display via telecommunications using a Government terminal, personal computer, or workstation.

The contract normally provides on-line access through the use of CITIS services or other similar information management services.

According to DoD 5000.2-R:

> *"Beginning in FY97, all new contracts shall require on-line access to, or delivery of, their programmatic and technical data in digital form, unless analysis shows that life-cycle time or life-cycle costs would be increased by doing so. Preference shall be given to on-line access to contractor developed data through contractor information services rather than data delivery."*

If a full CITIS is used, MIL-STD-974 provides information concerning core and tailorable CITIS functions that the SOW/SOO must specify and the contract must list as contract line items.

Telecommunication networks also provide an excellent opportunity to establish common practices for the exchange of business type data using Federal Information Processing Standards (FIPS) Publication (PUB) 161 for Electronic Data Interchange (EDI) standards. FIPS PUB 161 summarizes the adoption of the families of interrelated software standards known as ASC X12 and Electronic Data Interchange for Administration, Commerce, and Transport (EDIFACT) for electronic transmission of such data. The Program Manager must consider taking advantage of this opportunity for program administration process improvements.

3.9 -- Emerging Technologies

Information technology is rapidly changing the way organizations organize and format data. Program Managers must be prepared to assess and use appropriate new technologies offered by contractors and vendors. Program Managers must include in their assessment whether the new formats are interoperable with current data formats or whether it is cost-beneficial to convert existing data to new formats.

The following technologies are changing the traditional way of viewing data requirements and formats as

presented in figure 5-2. Some Program Managers are already using or considering using these technologies in their programs.

3.9.1 -- Object-Oriented Technology

Many database management and other information-intensive applications are already using object-oriented technology. This technology views bits of information as objects that can be "assembled" into documents "on-the-fly" in response to ad hoc queries, or re-used to satisfy future information requirements. Data objects are described by metadata (data about data) that provides pertinent information about the data object (e.g., preparation date, approval authority, relationship to other data objects, etc.).

Object-oriented technology will impact the description of data requirements. Today, most contracts describe data deliverables as documents. These documents often contain duplicate information (e.g., the name and high-level description of the defense system). In the future, data requirements may take the form of a database specification that defines data as data objects that will populate an object-oriented database. Software applications would then assemble these objects into different "views" of the database that would resemble today's documents.

Using object-oriented technology, the data originator might identify the defense system title and description as data objects and store each of them in a single location. Any view of the database (similar to today's document) that needed the title and/or description of the defense system would access those data objects and include them in the "view". Changes to data would be easier since data originators would only need to change the object containing the data rather than each document in which the data appears. Thus data item descriptions may someday describe data objects rather than documents, and users may access assembled multimedia "views" of data on-line rather than receive documents in hard-copy or electronic files.

3.9.2 -- Standard for the Exchange of Product Model Data (STEP)

STEP will integrate CAD/CAM files containing design data with other information related to specific items or parts (e.g., logistics support and packaging information). This will dramatically change the way enterprises organize, describe, and view data. The impact on data management will be similar to that of object-oriented technology. Data that is currently acquired and stored separately, (e.g., engineering drawings and associated lists, logistics data, and packaging information) will be created, stored, and accessed from a single integrated database.

3.9.3 -- Portable Document Format (PDF)

Almost any text and/or graphics document that can be output from an application can be output as a PDF file by using the Adobe Acrobat application. The PDF file can be read by anyone having a freely distributed Acrobat reader. Users can view and print documents exactly as formatted by the original application without having to load and run that application. Users can search for information as well as cut-and-paste information from the PDF file into other documents.

The availability of PDF files blurs the distinction between composed documents and processable data files. Users can view a document in a PDF file exactly as it appears to the originator of the document (e.g., with the same pagination). The user can also, however, retrieve some or all of the information in the file for

use in other documents, providing many of the advantages of processable data files. With the proper software, users can also annotate PDF files with comments and return them to the originators.

PDF files offer great flexibility for Program Managers who must share text and graphics files among a user community with a variety of hardware and software installations. PDF has become especially popular for conversion of legacy data from paper to digital formats.

Exhibit 1
Data Acquisition Questionnaire

The following questionnaire will assist in developing a GCO that will be used to tailor a particular data acquisition strategy to a specific program. Depending on the type of acquisition, size of the program, and the phase of acquisition, the content of the program-specific GCO may vary. Each program will require and have access to its own unique infrastructure. This questionnaire is intended to determine the infrastructure in place/required for program-specific support. Completion of this questionnaire is best accomplished as an element of the data call (see paragraphs 2.1 and 3.1). Note that some of the information collected with this questionnaire may not appear in the final GCO, but would be useful to the program manager (e.g., a point of contact for each functional area).

A questionnaire should be completed by each functional area at each activity that supports a specific program. The program manager should either identify all functional areas and distribute the questionnaire directly to them or distribute questionnaires to the activities with instructions for them to distribute the surveys to the appropriate functional areas.

Program Infrastructure Questionnaire

The following information is designed to help in determining the hardware, software and networking capabilities/requirements for the _____ program. This information will aid in determining the data acquisition strategy for this program. It will be used to develop a CALS Government Concept of Operation (GCO) and will be provided in an RFP or RFQ to potential bidders for developing a Contractor's Approach to CALS (CAC) and a CALS Implementation Plan (CALSIP). The types of data, delivery method, access media, mechanics of interchange, and use of the data required for this program will be based upon your responses to this questionnaire. Please fill out this questionnaire as completely as possible and return it to the program office no later than _____.

Questions may be directed to: _____ at
Phone: _____
FAX: _____
Address: _____
_____
_____
E-Mail: _____

I. -- General Information

List general information about your organization and point of contact for your functional area.

Function: _____
POC: _____
Phone: _____
Code: _____

General Data Requirements (e.g., engineering data, ILS data, drawings, etc.):

_____
_____
_____
_____
_____
_____

II. -- Data Requirements

Indicate the intended use of each data item that your organization requires to perform assigned functions in support of this program. The different means of using the data are described below:

View Only (V) -- The ability to examine a data file without the ability to change it. This includes viewing selected portions of one or several documents as well as side-by-side comparisons of documents.

Comment/Annotate (C) -- The ability to evaluate and highlight for future reference or to make annotations, approvals, and comments without the ability to change the original file. Annotations are associated with a specific item or location within a document such that the annotations are displayed whenever that point or area of the document is displayed.

Extract/Process/Transform (E) -- The ability to extract and modify the format, composition, and structure of all or a portion of the data into another usable form without affecting the original content or format.

Update/Maintain (U) -- The ability to change the data either directly or through controlling software, in the active files on the host computer.

Archive (A) -- The placing of data into a repository to preserve it for future use.

Secondary Distribution (2) -- Your organization distributes the data to another organization.

Data Description	Item ID	V	C	E	U	A	2
Engineering Drawings and Associated Lists	A001						
Configuration Management Plan	A002						
Request for Deviations	A003						
Engineering Change Proposals	A004						
Continuous Acquisition and Life-cycle Support Implementation Plan (CALSIP)	A005						
Airborne/Structureborne Noise Test	A006						
Builder's Trial Agenda	A007						

Initial Inventory Document	A008
System Safety Engineering Report	
Procurement Plan	

V = View only, C = Comment/Annotate, E = Extract/Process/Transform, U = Update/Maintain, A = Archive, 2 = Secondary Distribution

III. -- Hardware Capabilities

List computer and peripheral equipment that will be used by your organization in support of this program.

Hardware
Personal Computers
Mainframes/Minis
Other Hardware (e.g., scanner, optical drive, Bernoulli drive, etc.)

Check the appropriate system block to verify whether or not your organization has access to the following Automated Information Systems/CALS Initiatives:

☐ ADMAPS	☐ EDCARS	☐ NALCOMIS
☐ Advance Industrial Mgmt.	☐ FCIM	☐ NALDA
☐ ATIS	☐ IADS	☐ NEDALS
☐ ATOS	☐ IETMs	☐ RAMP
☐ CAD2	☐ JCALS	☐ SCLSIS
☐ Computer-Based Training	☐ JEDMICS	☐ SNAP III
☐ CMIS	☐ LOGPARS	☐ SPA
☐ DSREDS	☐ M-SPECS	☐ TMPODS
☐ E-STEPS	☐ MEARS	

Figure 5-3.

Other (List):_____
_____
_____
_____

IV. -- Software Capabilities

List operating systems and versions used with hardware described previously. Describe the most common and/or standard commercial software products that have been selected by your organization for each category. Provide version numbers if possible.

	Personal Computer Operating System and Application Software	**Mainframe/Mini Operating System and Application Software**
Operating Systems		
Word Processing		
Database Management		
Spreadsheets		
CAE/CAD/CAM		
Graphics/Illustrations		

CASE Tools

Program Mgmt.:
incl. Scheduling,
Workflow mgrs.

Other

V. -- Network Capabilities

Describe Local and Wide Area Network capabilities that will be used in support of this program.

	Equipment/Product
Network Operating Systems (e.g., Novell Netware, Apple Talk, Windows NT, etc.)	
Servers (e.g., E-mail packages, LAN, WAN, etc.)	
Network Protocols (e.g., TCP/IP, Ethernet, POSIT, etc.)	
External Communication Capabilities (e.g., direct line, DDN, NEWNET, Internet, modems, etc.)	

VI. -- CALS Standards/Specifications

Indicate your organization's familiarity and use of the following standards/specifications by putting a check next to the appropriate documents:

Specifications:	**Standards:**	**Other:**
- MIL-PRF-28000 (IGES)	- MIL-STD-974 (CITIS)	- ANSI/EIA 548 (EDIF)
- MIL-PRF-28001 (SGML)	- MIL-STD-1840 (Auto. Interchange of TI)	- FIPS 146-2 (POSIT)

- MIL-PRF-28002 (Raster)
- MIL-PRF-28003 (CGM)
- MIL-M-87268 (IETMs)
  MIL-D-87269
  MIL-Q-87270
- MIL-STD-1777 (IP)/
  MIL-STD-1778 (TCP)/
  IEEE 802.3
- FIPS 151-2 (POSIX)
- FIPS 161 (EDI)
- FIPS 186 (Digital Signature Standard)
- ISO 10303 (STEP)
- ISO 10744 (HyTime)
- ISO 12083 (Elec. Publishing)

Other (List):_____
_____
_____
_____

VII. -- CITIS User Information

Indicate your organization's expected access to each of he following data items via the CITIS. Indicate the approximate number of users, how often the data will be accessed, the immediacy of access, how long the data must remain available on-line (before it can be archived), and how the data will typically be processed/used. In the case of multiple users of a single data item, input values for the most stressing cases (i.e., one user accesses data monthly and the other accesses it weekly -- list "weekly" in the Access Frequency column).

Data Description	Item ID	No. of Users	Access Frequency[1] (Y/N)[2]	Is immediate access req'd? on-line?[3]	How long will data be needed	How will the data be used?[4]
Engineering Drawings and Associated Lists	A001					
Configuration Management Plan	A002					
Request for Deviations	A003					
Engineering Change Proposals	A004					
Continuous Acquisition and Life-cycle Support Implementation Plan (CALSIP)	A005					
Airborne/Structureborne Noise Test	A006					

Builder's Trial Agenda	A007
Initial Inventory Document	A008
System Safety Engineering Report	
Procurement Plan	

Note 1: ***Daily, Weekly, Biweekly, Monthly, Bimonthly, Quarterly, Semiannually, Annually***

Note 2: ***Yes => data must be stored on-line and available immediately***
No => data can be stored off-line and provided on-line upon request within a reasonable time limit (e.g., 24 hours)

Note 3: ***<60 days, 180 days, 1 year, life of contract***

Note 4: ***View/Process on-line, Download, Print***

Exhibit 2
Sample GCO Developed with Aid from this Guide

This sample GCO is intended for tutorial purposes only and does not necessarily reflect any real or implied infrastructure, program, capabilities, or requirements.

Actual hardware, software, and network vendor names and product names have been removed in Table 5-1. In an actual GCO, vendor names and product names including version numbers would be filled in.

1.0 -- Introduction

The Sample program was established in 1988 to support the U.S. defense capability. The current project involves a major redesign of its onboard computer system. This redesign will provide substantially greater capability for the Sample system. The Program Office for the Sample program is located in Washington, DC

The Sample program plans to implement Continuous Acquisition and Life-cycle Support (CALS) to support paperless operations within Sample programs within the next year. The overall objective of this CALS effort is to design, implement, and use an Integrated Data Environment (IDE) across the Sample organization to the maximum extent possible. The IDE will provide efficient and effective digital support for all Sample systems and supporting business management functions. This IDE will include essential linkages between the Sample program and its prime contractors as well as with other participating Government organizations.

The IDE concept is based upon using Government off-the-shelf (GOTS) and Commercial off-the-shelf (COTS) tools and products already owned by the government for the purpose of performing digital project

management operations. Data will be created once and be made accessible to authorized users through the use of a data management system as it is released into the IDE, regardless of location.

The IDE will allow all personnel involved in the management, production, and support of the system to access, manage and share (via network resources) data in a format appropriate for its intended use. The IDE will also allow these personnel to automate and participate in on-line, integrated business processes regardless of organization or physical location. The IDE will be easily expandable so that additional Sample personnel and other organizations who need access to the data can get it. The IDE will also be expandable so that new tools and additional data can be easily added to it.

1.1 -- Purpose

This document is provided as Government Furnished Information (GFI) to describe the Sample program's implementation of CALS and the creation of a digital data environment. It will describe how the program intends to create, manage, and use data in conformance with the CALS strategy. CALS is a strategy that will enable more effective generation, exchange, storage, and use of data for defense systems and equipment, including management, planning, design/engineering, manufacturing, logistic support, and operation data. This GCO is intended to give Sample data users, participating contractors, and other Government activities an understanding of the IDE approach that will be implemented for this program.

1.2 -- Scope

The strategies set forth in this document are applicable to Sample programs, prime contractors, and to other Government organizations providing support to this project. The concepts contained in this document apply to all types of data that are generated by prime contractors and the Government during the life-cycle phases of the Sample program.

1.3 -- Application

The GCO is provided for both Government and contractor planning purposes and articulates the Government's commitment to achieving digital data exchange within the Sample program. This GCO is provided to Government and contractor activities as guidance for their preparation of CALS-related plans and development of IDE capabilities. Government activities should use this document in defining their participation in the Sample program and the exchange/use of digital data. Contractors should use the GCO in conjunction with a Request for Proposal (RFP) as source information for developing the Contractor's Approach to CALS (CAC) and/or an IDE implementation plan (e.g., CALS Implementation Plan [CALSIP], IDE Implementation Plan). This GCO and resulting CAC/implementation plan provides a basis for further Government and contractor planning for implementation of CALS in the Sample program. Participating activities are encouraged to propose beneficial changes to the information provided herein that improve operation, increase quality, and reduce costs.

1.4 -- Approach

This GCO is presented in five sections. This first section provides an introduction to the Sample program CALS implementation. Section 2 provides additional details regarding the implementation to include background, objectives, phases, and planning. Section 3 provides a discussion on the types and formats of

data that will be available within the IDE. Section 4 discusses the core functionality that will be provided in the IDE. Section 5 outlines current capabilities of the Sample program infrastructure and provides a view toward the future capabilities expected within the IDE.

Next Section